

Task Force 02

SUSTAINABLE CLIMATE ACTION AND INCLUSIVE JUST ENERGY TRANSITIONS

Science, Technology, and Innovation (STI) in Territorial Collaborative Laboratories Can Help Achieve the Nationally Determined Contributions (NDC) and Sustainable Development Goals (SDG) Targets in G20 Countries

Paulo Gadelha, Board of Directors President and Executive Committee member, Atlantic International Research Centre – AIR Centre, Portugal. Coordinator and Senior Researcher, Fiocruz Strategy for 2030 Agenda - EFA 2030/Fiocruz, Brazil

Heloisia Tozato, Collaborating Researcher, Fiocruz Strategy for 2030 Agenda - EFA 2030/Fiocruz, Brazil

Luiz Galvão, Senior Researcher, Fiocruz Strategy for 2030 Agenda - EFA 2030/Fiocruz, Brazil

Edmundo Gallo, Senior Researcher, Observatory of Sustainable and Healthy Territories of Bocaina (OTSS) and Fiocruz Strategy for 2030 Agenda - EFA 2030/Fiocruz, Brazil

Eliana Sousa Silva, Founding Director, Redes da Maré, Brazil

José Luiz Moutinho, Chief Business and Networking Officer, Atlantic International Research Centre – AIR Centre, Portugal

Sérgio Portella, Collaborating Researcher, Fiocruz Strategy for 2030 Agenda - EFA 2030/Fiocruz, Brazil



TF02

Abstract

Collaboration for development is at the core of the G20's previous initiatives to ensure social, economic, and environmental well-being. Territorialized collaborative laboratories are spaces where academic, community, and socio-technical operation and management networks come together to co-create and experiment with local solutions to complex problems. In G20 developing countries, this knowledge ecologies and innovations are extremely relevant facing complex Anthropocene challenges such as hunger, poverty, and inequality within the framework of sustainable development and decarbonization. It provides theoretical, methodological, and practical guidance, alongside society in a shared governance, to develop and implement the 2030 Agenda in line with the UN Technology Facilitation Mechanism (TFM) framework, which links territory, the knowledge ecologies and the use of social technologies. In this sense, this Policy Brief will highlight that territorialized collaborative laboratories can amplify and speed up the G20 countries' efforts to transition towards the proposed Nationally Determined Contributions (NDCs) of the Paris Agreement, aligning with the principles of the 2030 Agenda and its Sustainable Development Goals. It will call for the participation of the G20 in those initiatives through its national capacities, STI global governance, and funding.

Key-words: Global Scientific Governance, Vulnerable Populations, Inclusion, Equitable Societies.

Diagnosis of the Issue

1. The challenge

The United Nations' 2030 Agenda represents a pillar in global geopolitics for addressing historical social injustices and the effects of the current humanitarian and climatic crisis, the persistent impacts of the COVID-19 pandemic, uncertainties in international relations, and the financial instability of nations. It recognizes and addresses both the differentiated causes and effects of these multiple crises among and within countries, guiding international cooperation and national policies through its Sustainable Development Goals (SDGs).

However, according to the 2023 SDG Report (UN 2023), progress towards achieving the SDGs of Agenda 2030 has been minimal. The impact of this scenario, exacerbated by the COVID-19 pandemic, has even greater effects on low-and middle-income countries, especially on poor and vulnerable families (UN 2023). These countries face unique challenges in protecting vulnerable populations, such as ethnic minorities (including indigenous peoples, Quilombola communities, riverine dwellers, small-scale extractivists, artisanal fishers, traditional communities, and family farmers, among others), migrants, and refugees, among others, who are marginalized and at risk due to a combination of historical and current socioeconomic, environmental, and political factors. Some of the common struggles faced by these people are access to basic resources, inequality and discrimination, food and nutritional insecurity, violence and armed conflicts, sociotechnical disasters, access to justice and human rights, recognition of their wealth and their way of life as heritage and means to sustainable development, and political participation.

2. The G20's role

In the face of global polycrisis and the urgency of the Agenda 2030 implementation, the G20 plays a crucial role in cooperative efforts for sustainable development, given its significant economic and political power in setting agendas and mobilizing resources for the economic transition aligned with the sustainable development agendas.

Collaboration for development has always been at the heart of G20 initiatives to ensure the social, economic, and environmental well-being of countries. The central focus of the G20 Finance Track and the Brazilian Global Economy Group has been the discussion on reducing inequalities. Science20 also recognizes the importance of active societal participation in advancing scientific research, dissemination, and use of generated knowledge for sustainable development. Think20 emphasizes that to ensure a fair, equitable, and inclusive global transition, development strategies must consider the specific needs, national circumstances, and structural vulnerabilities of vulnerable populations. There is, therefore, a consensus on the role of co-participatory science, technology, and innovation in the design of sustainable and healthy territories and in the pursuit of the well-being of vulnerable populations.

3. Territorialized collaborative laboratories

Territorialized collaborative laboratories (territorialized collabs) are physical and virtual spaces where academic, community, and sociotechnical networks of operation and management come together to co-create and experiment with solutions to local challenges in pursuit of the well-being of vulnerable populations. That starts with the horizontal exchange of experiences of articulation, reflections, and co-production of knowledge between academia and social movements, for the shared construction and resolution of

conflicts and disputes that transform the relationship between the territories and affect the daily lives of populations (Gallo and Nascimento 2019). It composes a shared governance to implement UN Technology Facilitation Mechanism (TFM) framework, which links territory, knowledge ecologies, and the use of hybrid technologies that associate social technologies with frontier technological convergence.

Territorialized collabs operate on the premise that for vulnerability reduction policies (whether economic, environmental, cultural, or social) to be effective in practice, it is necessary to establish a genuine connection between the systematic approach of the scientific method and reality, derived from the conditions and practices existing in the territories in question (Gallo and Nascimento 2019). They reinforce Santos' discussion (Santos 2003) about the reality-based approach being essential to prevent such policies from becoming mere theoretical representations, ensuring that they are rooted in the local dynamics that constantly shape and transform them.

In addition to social participation, which values pluralism, territorialized collabs respect and reinforce the sense of identity, that is, the “feeling of belonging to what belongs to us” in the used territory (Santos 2003 47). They promote autonomy, equity, and socio-environmental justice by stimulating the development of freedom of speech and individual and collective capabilities in the pursuit of advancing the struggle flags of vulnerable and at-risk populations (Gallo and Nascimento 2019).

Recommendations

As a central group in development collaboration that aims to ensure social, economic, and environmental well-being, the expertise of territorialized collaborative laboratories must form the core knowledge base of the G20 on tangible solutions for reducing the vulnerability of populations in the global economic transition towards sustainable climate action and fair and inclusive energy transitions. Based on the above, this policy brief presents the following recommendations:

i) Creation of a global network of territorialized collaborative laboratories

The G20 must bring together and strengthen spaces for scientific co-creation and co-implementation of existing territorialized solutions, as well as encourage new spaces to be established and added. It promotes the co-participation in the effective management of disaster crises encompassing public health; co-creation of social cartography to identify local priorities and to design strategic plans for effective urban and rural management; co-management of sensitive coastal areas; and co-promotion of bioproducts and bioenergy through the bioeconomy for economic diversification and nature conservation, among others. This knowledge ecologies and innovations are extremely relevant facing complex Anthropocene challenges such as hunger, poverty, and inequality within the framework of sustainable development and decarbonization.


As an example, the global K4P Platform brings together collaborative laboratories that prioritize people in promoting healthy and sustainable territories through research and innovative social practices, with the concomitant job creation and initiatives that drive

the ecological transition of the economy and society (K4P Alliances 2023). In Brazil, the collab Observatory of Sustainable and Healthy Territories of Bocaina (OTSS) has contributed to the well-being of caiçara communities, local and regional governance (Setti et al. 2016; Cortines et al, 2016), public health (Setti and Gallo 2015) and even the reduction of socio-environmental disasters (Freitas and Coelho-Netto 2016). The OTSS partnership with Portugal has broadened the scope of the lessons learnt for application in other territories. Those territorialized collab experiences must be replicated in the G20 countries to achieve the SDGs.

Another example constitutes the Redes da Maré collab initiatives within people from 16 slums in Rio de Janeiro, Brazil. During the Covid-19 pandemic, their community-based intervention ensured the anticipation of the vaccination calendar and reached a coverage of 94.4% of the adult population immunized. It also monitored the effectiveness of the Astrazeneca vaccine produced in Brazil, assessed the impact of the pandemic in the territory, and studied the effects of Long Covid. In addition to this monitoring, the study gathered important information on other aspects of health in Maré, such as the existence of comorbidities, data on mental health and profiles of the use of primary care services (Redes da Maré 2021).

ii) Guarantee funds for the establishment of a global network of territorialized collaborative laboratories and encourage international funds for development agendas to be implemented in dialogue with these spaces.

The territorialized collabs are aligned with the thematic priorities of the Sustainable Finance Working Group and the G20 Financial Track Infrastructure Working Group, as



well as the Sherpa Track working groups on Energy Transition, Environment, Climate and Sustainability, reducing disaster risk, agriculture, and employment. The G20 must allocate funds towards the establishment of a global network of territorialized collaborative laboratories. This approach could, for instance, incorporate the triangular cooperation proposal (collaboration between nations in the Global South, supported by multilateral organizations and/or donors from the Northern Hemisphere) and leverage G20 matchmaking mechanisms to accomplish the SDG goals of the 2030 Agenda and other development agendas (Haug 2023).

The G20 must encourage international funds for development agendas, such as the Green Climate Fund (GCF), to use actions carried out in territorialized collaborative laboratories as a criterion for project selection. This ensures that specialized knowledge and technocratic carbon management do not undermine democratic deliberation processes in public decision-making, as has been the case with adaptation and mitigation projects that hide socio-environmental issues and territorial conflicts (Swyngedouw 2010).

iii) Promoting the integration of territorialized collaborative laboratories into national science, technology, and innovation (STI) policies in G20 countries.

The G20 must insist that member states legitimize the science generated in territorialized collaborative laboratories in their respective national STI policies. At the national level, it is important to have an unequivocal commitment to supporting collaborative research and applying its results to address challenges identified by communities. This implies not only recognizing the validity and relevance of the science

produced in these initiatives but also ensuring adequate internal funding, infrastructure, and institutional support for their continuity and expansion.

The Amazonia Institute of Technology (AmIT), for example, is an ambitious and innovative project that interconnects the knowledge ecologies of the Pan-Amazon countries. It is based on an innovative and integrative perspective and differs from traditional research institutions. It focuses on co-participation and co-creation, prioritizing issues, and products for the *amazônidas* that have almost always been neglected. AmIT aims to “contribute to the socio-economic development and improvement of the quality of life of the Amazonian population, in synergy with the conservation and valorization of the forest and rivers” (IEA-USP and Amazonia 4.0 Institute 2022, 2).

The G20 must urge that member states promote STI in territorialized collaborative laboratories (use of the knowledge ecologies, pedagogy of autonomy, and communicative-strategic governance) to drive innovation in the bioeconomy, for example, in key sectors such as agriculture, health, energy, and the environment. This should ensure governance mechanisms and participatory management in the territory, citizenship rights, equity, and quality of life for populations, enabling communities to remain in their territories.

The G20 should insist that member states utilize the co-participatory knowledge generated in territorialized collaborative laboratories in institutional policies to consolidate more inclusive and effective approaches to responding to the needs and demands of local communities, ensuring more participatory and transparent governance.

iv) Establishing global metrics on research production from territorialized collaborative laboratories that provide theoretical, methodological, and practical pathways and co-implement solutions with society, focusing on vulnerable populations.

The G20 must promote the expansion of currently used metrics to describe the progress of global science and innovation in a way that specifies which ones have been achieved in territorialized collaborative laboratories, in a participatory manner with society. For example, the Science20, by encouraging the bridge between scientific practice and society and global collaboration in research, requires metrics capable of identifying the impact of research with and for society.

Scenario of Outcomes

The G20 countries prioritize the establishment and funding of territorial collaborative laboratories, providing theoretical, methodological, and practical guidance, alongside society, to develop and implement solutions, particularly aimed at vulnerable populations. It implements the 2030 Agenda, according to the UN Technology Facilitation Mechanism (TFM) framework, which links territory, the knowledge ecologies and the use of hybrid technologies that associate social technologies with frontier technological convergence.

In this sense, the G20 makes progress in setting up institutional arrangements that associate these guidelines with shared governance between local thinking and the scientific and technological community. The territorialized collaborative laboratories, as presented in this Policy Brief, are scaled up through wider networks. That co-participation, co-creation, and co-implementation of solutions between society, academic, community, and socio-technical networks in G20 countries led to three scenarios of outcomes.

Scenario 1: Accelerated transition and inclusive development.

Outcomes:

- Effective and fair implementation of national plans under the Paris Agreement to increase renewable energy production, such as solar and wind energy; reduce dependence on fossil fuels; and promote energy efficiency. It promotes the green recovery pacts, such as the European Green Deal; the G20 Initiative on Clean Energy Transitions and Sustainable Energy; the Green Climate Fund; and the implementation of the Sustainable Development Goals (SDGs) of the 2030 Agenda.

- Successful and equitable application of sustainable and intelligent infrastructure in G20 countries, such as the G20 Global Infrastructure Partnership (GIP); G20 Global Infrastructure Platform (GI Hub); G20 Digital Connectivity Initiative; the Green Infrastructure Projects; and Smart Cities in G20 countries are implemented.
- Scaling up proficient and fair deployment of the G20 initiatives, as the Global Agriculture and Food Security Programme; Global Alliance for Soils and the Global Partnership for Sustainable Agriculture; G20 Digital Agriculture Initiative; Food and Nutrition Resilience Partnership; and the Global Coalition on Reducing Food Loss and Waste.

Scenario 2: Enhanced global cooperation and governance to promote bioeconomy and nature-based solutions in G20 countries.

Outcomes:

- Effectiveness in implementing G20 Global Initiative on Reducing Land Degradation and Enhancing Conservation of Terrestrial Habitats. Examples include adopting sustainable land management practices and implementing reforestation projects.
- Social equity through the implementation of the G20 Agriculture Ministers' Declaration on Food Security and Nutrition. This is achieved by promoting sustainable agricultural practices that preserve biodiversity and utilize natural resources efficiently.
- Scaling up the G20 Nature-Based Solutions for Climate Adaptation and Biodiversity. Examples include restoring mangroves and wetlands for coastal protection, implementing ecological corridors and promoting green infrastructure in urban areas.

- Implementation of the G20 Global Oceans Initiative, which aims to combat marine pollution, promote sustainable fishing, and conserve marine biodiversity. This outcome is also aligned with the Blue One Health approach.

Scenario 3: Empowered communities and sustainable development.

Territorial collaborative laboratories in G20 countries empower local communities to address their own challenges and contribute to sustainable development, fostering resilience and self-reliance.

Outcomes:

- Scaling up health innovation and access to care. This includes promoting the Global Health Security Agenda; expansion and modernization of diagnostic laboratories in low-and middle-income countries; telemedicine in rural areas; and research and development for neglected diseases. It promotes the G20 Brazil Alliance for Regional Production and Innovation to combat diseases with strong social determinants.
- Strengthening the Global Partnership for Education. This outcome includes the G20 agenda on digital skills; youth empowerment and preparation for the labour market, such as the G20 Youth Employment Initiative; the Women 20 Initiative; and the implementation of the Education for Sustainable Development Programme.
- Scaling up financial inclusion and economic development. This involves promoting effective financial inclusion practices. Some examples are the effort within G20 Women's Economic Empowerment Initiative; G20 High Level Principles on Financing Micro, Small and Medium Enterprises; and the national financial inclusion strategies, as carried out in India.

These scenarios outline potential outcomes that demonstrate the transformative potential of territorialized collaborative laboratories in achieving sustainable development, responding to the needs of vulnerable populations in G20 countries and promoting specific G20 agendas in 2024.

References

- Cortines, Anna et al. "Social Cartography and the Defense of the Traditional Caiçara Territory of Trindade." In: *Climate Change Adaptation in Latin America*, edited by Walter Filho and Leonardo Freitas, 8-27. Hamburg:Springer, 2016.
- Freitas, Leonardo, and Ana Netto. "Reger Córrego Dantas: a collective action for coping natural threats and environmental disaster reduction." *Ciência & Trópico* 40, no. 1(2016):165-190.
- Gallo, Edmundo, and Vagner Nascimento. *O território pulsa: territórios sustentáveis e saudáveis da Bocaina: soluções para a promoção da saúde e do desenvolvimento sustentável territorializados*. Fiocruz: Paraty, 2019.
- Haug, Sebastian, Cheng, Han, Waisbich, and Laura Trajber. "Accelerating SDG Implementation through Triangular Cooperation: A Roadmap for the G20". T20 Policy Brief - Task Force 6: Accelerating SDGs—Exploring New Pathways to the 2030 Agenda (2023):1-18.
- IEA-USP and Amazonia 4.0 Institute. *Amazonia Institute of Technology (AmIT) Executive summary*. São Paulo: Instituto Arapyaú, 2022.
- K4P Alliances - Knowledge for People, the Planet and Prosperity through Partnerships. White Paper, 2023. Accessed March 11, 2024. <https://k4palliances.com/>.
- Redes da Maré. *Conexão Saúde de Olho na Covid*. Rio de Janeiro: Redes da Maré, 2021.
- Santos, Milton. "O dinheiro e o território". *GEOgraphia* 1 no. 1 (1999):7-13.
- Santos, Milton. *Por uma outra globalização: do pensamento único à consciência universal*. Rio de Janeiro: Record, 2003.

Setti, Andreia, Helena Ribeiro, Ulisses Azeiteiro and Edmundo Gallo. “Governance and the promotion of sustainable and healthy territories: the experience of Bocaina, Brazil (2016).” *Revista da Gestão Costeira Integrada* 16, no 1 (2016):57-69.

Setti, Andreia and Edmundo Gallo. “Promoção da saúde e desenvolvimento sustentável: proposta de matriz de avaliação qualitativa de projetos locais”. *Saúde em Debate* 33, no.83(2009):107-419.

Swyngedouw, Erik. “Apocalypse Forever? Post-political Populism and the Spectre of Climate Change”. *Theory, Culture & Society*, 27, no. 2–3, 2010:213–232.

United Nations. *The Sustainable Development Goals Report 2023: Special Edition*.

New York: United Nations Publications, 2023.



Let's **rethink** the world

